MONSANTO PRODUCT NAME

MCS-352B HYDRAULIC ASSEMBLY LUBRICANT

MONSANTO COMPANY
800 N. LINDBERGH BLVD.
ST. LOUIS, MO 63167

Emergency Phone No.
(Call Collect)
314-694-1000

PRODUCT IDENTIFICATION

MCS-352B lubricant is a proprietary mixture of components. Its composition is a trade secret of Monsanto Company. It has no CAS number. All components appear on the Inventory of Chemical Substances published by the U.S. Environmental Protection Agency (EPA) under the authority of the Toxic Substance Control Act (TSCA).

Chemical Family:	Phosphate Ester
DOT Hazard Class:	Product is not classified as a hazardous material by the U.S. Department of Transportation.
Label Requirements:	Product Label
U.S. Surface Freight Classification:	Heat Transfer Agent or Media, N.O.I.B.N.
Reportable Quantity (RQ) Under U.S. EPA CERCLA Regulations:	Not Listed
Hazardous Chemical(s) Under OSHA Hazard Communication Standard:	This product contains, as a component, the substance listed below which is identified as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200): Tributyl Phosphate, CAS Reg. No. 126-73-8

WARNING STATEMENTS

CAUTION!
MAY CAUSE IRRITATION TO EYES, SKIN, AND RESPIRATORY TRACT

PRECAUTIONARY MEASURES

Avoid contact with eyes, skin, and clothing
Avoid breathing vapor or mist.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID: IF IN EYES, flush with plenty of water. Call a physician if irritation persists.

IF ON SKIN, flush with plenty of water. Wash clothing before reuse.

IF INHALED, remove to fresh air. If not breathing give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

OCCUPATIONAL CONTROL PROCEDURES

Eye Protection: Wear chemical splash goggles and have eye baths available where there is significant potential for eye contact.

Skin Protection: Wear appropriate protective gloves that provide a barrier and protective clothing to prevent skin contact. Consult glove manufacturer to determine appropriate type glove for given application. Wear a face shield and an apron that provides a barrier when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling.

Respiratory Protection: Avoid breathing vapor or mist. Use NIOSH/MSHA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical safety goggles. Consult respirator manufacturer to determine type equipment for given application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed. High airborne concentrations may require use of self-contained breathing apparatus or supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR 1910.134.

Ventilation: Provide ventilation to control exposure levels below airborne exposure limits. Use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Airborne Exposure Limits: Product: MCS-352B

OSHA PEL: None Established
ACGIH TLV: None Established

Contains: Tributyl Phosphate (CAS No. 126-73-8)

OSHA PEL: 5 mg/m^3 (0.4 ppm) 8-hour time-weighted average
ACGIH TLV: 2.5 mg/m^3 (0.2 ppm) 8-hour time-weighted average
ACGIH TLV: 5 mg/m^3 (0.4 ppm) short-term exposure limit

FIRE PROTECTION INFORMATION

Flash Point: 350°F ***Method:*** Cleveland Open Cup

Extinguishing Media: Water spray, foam, dry chemical, CO_2 or any Class B extinguishing agent.

Special Fire Fighting Procedures: Fire fighters and others who may be exposed to products of combustion should wear full protective clothing and self-contained breathing apparatus. Equipment should be thoroughly cleaned after use.

Unusual Fire and Explosion Hazards: Products of decomposition include hazardous oxides of phosphorus, carbon monoxide, and hydrocarbons.

REACTIVITY DATA

Hazardous Decomposition Products: Oxides of phosphorus may be produced in fires along with CO, CO_2, soot, smoke, and hydrocarbons.

Hazardous Polymerization: Does not occur.

HEALTH EFFECTS SUMMARY

The following information presents both human experience and the results of scientific experiments used by qualified experts to assess the effects of MCS 352B hydraulic assembly lubricant on the health of industrially exposed individuals and to support the Precautionary Statements and Occupational Control Procedures recommended in this document. To avoid misunderstanding, the data provided in this section should be interpreted by individuals trained in evaluation of this type of information.

Human Experience

Dermal contact and inhalation are expected to be the primary routes of occupational exposure to MCS 352B hydraulic assembly lubricant. Occupational exposure to this material has not been reported to cause significant adverse human health effects. Though occupational exposure to MCS 352B has not been reported to produce an irritation response, human experience indicates that tributyl phosphate, a component of MCS 352B lubricant, is irritating to the eyes, skin and respiratory tract of exposed individuals. Inhalation of concentrations of tributyl phosphate above the recommended TLV may produce nausea and headache.

Toxicological Data

Monsanto has not conducted toxicity studies on MCS 352B hydraulic assembly lubricant. However, toxicity information on a closely related material indicates:

Oral LD_{50} (Rat): 5,373 mg/kg, Practically Nontoxic
Dermal LD_{50} (Rabbit): Greater than 2,000 mg/kg, Slightly Toxic
Eye Irritation (Rabbit): (FHSA) 11.2 on a scale of 110.0, Slightly Irritating
Skin Irritation (Rabbit): (FHSA) 1.7 on a scale of 8.0, Slightly Irritating
Inhalation LC_{50} 4-hr (Rat): Greater than 1.81 mg/l (nominal concentration)

Components

Data from Monsanto studies and from the scientific literature on tributyl phosphate, a component of MCS 352B, which has been identified under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200), are discussed below:

Tributyl Phosphate

Single intraperitoneal injections of tributyl phosphate at dosages of 850 to 1,000 mg/kg were reported to cause paralysis in mice.

A neurotoxicity study was conducted with tributyl phosphate in chickens. Adult hens were dosed orally with a single dose of 1.84 g/kg. This dose was repeated 21 days later. No gross signs of neurological effects and no microscopic evidence of demyelination in brain, spinal cord or sciatic nerve were observed.

Tributyl phosphate was administered to rats by gavage at doses of 0.28 and 0.42 ml/kg/day for 14 consecutive days. Decreased body weights were reported in all treatment groups at 7 days and in low-dose females at 14 days. Conduction velocity of the caudal nerve was reduced in high-dose males. Increases in refractory periods of caudal nerve were reported in high- and low-dose groups. Morphological alterations in unmyelinated fibers were reported in the high-dose groups. No axonal degeneration was observed.

(Health Effects Summary Continued On The Next Page)

HEALTH EFFECTS SUMMARY (Continued)

Rats were administered tributyl phosphate by gavage at doses of 0.14 to 0.42 ml/kg/day for 14 consecutive days. Alterations in organ weights and hematological and biochemical parameters were reported in low- and/or high-dose treatment groups. One of 4 male rats in the high-dose group examined for histopathological changes was reported to show degenerative changes in the seminiferous tubules. No other histopathological abnormalities were observed.

Reduced body weights, reduced feed consumption and altered organ weights with decreased serum enzyme and glucose levels and increased cholesterol and/or urea nitrogen levels were reported in male rats fed dietary concentrations of 0.5% and 1.0% tributyl phosphate for 10 weeks. Blood coagulation times were also prolonged. Following this *in vivo* treatment with tributyl phosphate, brain cholinesterase activity was significantly elevated. Activities of serum and liver cholinesterase did not change. Following *in vitro* treatment of rat brain and liver homogenates and serum with tributyl phosphate, no change in cholinesterase activities were reported.

Rats were fed diets containing tributyl phosphate at levels of 8, 40, 200, 1000 or 5000 ppm for 90 days. Hematological, biochemical, and coagulation parameter changes and increased liver weights were reported in the high-dose animals. Urinary bladder hyperplasia was observed among male and female rats at 5000 ppm and among males given 1000 ppm. In a separate study, male and female rats given tributyl phosphate by gavage at levels of 0.20 and 0.30-0.35 ml/kg/day 5 days/week for 18 weeks were also reported to exhibit urinary bladder hyperplasia.

Another feeding study was conducted in rats with tributyl phosphate at a dietary level of 0.5% for 9 weeks. Decreased body weights and altered organ weights with increased urea nitrogen levels were reported. No adverse effects on hematological parameters, blood coagulation time, or serum enzyme activities were reported.

Cholinesterase activities of human red cell hemolysate (substrate concentration $1x10^{-3}$ M acetylcholine) and human plasma (substrate concentration $1x10^{-2}$ M acetylcholine) were reported to be inhibited by tributyl phosphate *in vitro.*

Tributyl phosphate administered intraperitoneally to rats at dosages ranging from 16 to 226 mg/kg produced a dose-dependent increase in serum B-glucuronidase activity. No effect on serum cholinesterase activity was reported at any dose level tested.

No mutagenic activity was reported in microbial assays using *Salmonella* and *Escherichia* organisms or in a sex-linked dominant lethal assay in *Drosophila.*

Following a single oral dose (14 mg/kg) of radiolabeled tributyl phosphate to male rats, 50%, 10% and 6% of the administered radiolabel was reported to be excreted in urine, exhaled air, and feces, respectively, within one day. Male rats given a single intraperitoneal dose (14 mg/kg) of radiolabeled tributyl phosphate were reported to excrete 70%, 7% and 4% of the administered radiolabel in urine, exhaled air, and feces, respectively, within one day.

Additional Information

A Threshold Limit Value (TLV) has been established by the American Conference of Governmental Industrial Hygienists for tributyl phosphate. For further information on tributyl phosphate, please refer to the current edition of the *Documentation of Threshold Limit Values.*

PHYSICAL DATA

Appearance:	Very viscous purple oil
Boiling Point @ 760 mm Hg:	350°C *(with decomposition)*
Pour Point:	20°F
Specific Gravity @ 25/25°C:	1.02
Viscosity @ 210°F:	190-225 centistokes

Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

SPILL, LEAK & DISPOSAL INFORMATION

Emergency Spill and Leak Information: Spills should be absorbed on a suitable medium such as sawdust, clay or filtercel and disposed of as recommended below.

Disposal Information: Waste product should be incinerated in compliance with local, state, and federal regulations.

This material should not be dumped, spilled, rinsed, or washed into sewers or public waterways.

ADDITIONAL COMMENTS

Environmental Toxicity Information:

Environmental toxicity studies have not been conducted with MCS-352B hydraulic assembly lubricant. However, studies have been conducted with tributyl phosphate, a component of MCS-352B:

Tributyl Phosphate

48-hr EC_{50} *Daphnia magna:* 9.0 mg/l, Moderately Toxic
96-hr LC_{50} Fathead Minnow: 6.4 mg/l, Moderately Toxic
96-hr LC_{50} Rainbow Trout: 11.0 mg/l, Slightly Toxic

Tributyl phosphate was evaluated in a semi-continuous activated sludge test, the Thompson-Duthie-Sturm biodegradation assay and in a river die-away test. Based on results from these assays, tributyl phosphate was classed as readily degraded.

DATE: 5/1/86 **SUPERSEDES:** 12/19/83

MSDS NO.: M00006601

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

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Monsanto MATERIAL SAFETY DATA

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